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ABSTRACT

Eighty-four freshmen nursing students at the University of Kentucky were randomly assigned to two experimental and two control groups. The experimental groups participated in a developmental reading program over a 10-week period, while the control groups were only allowed access to the library and encouraged to use the time for studying. Different forms of the Maintaining Reading Efficiency Test, History were used as pretest, post-1, and post-2 tests, administered respectively during the first week, immediately after the 10 weeks, and 5 months later. No initial significant differences were found between the groups on all variables, but the post-tests showed significant differences favoring the experimental group on reading rate and efficiency and favoring the controls on reading comprehension. Post-1 test results indicated that the experimentals improved significantly their reading rate and efficiency but dropped significantly in comprehension, while the controls experienced no significant change in reading rate or efficiency but improved significantly on comprehension. Post-1 and post-2 comparisons revealed a significant drop on all variables for both groups with the one exception being reading rate for the controls. No significant differences were found in between-group or within-group comparisons in predicted and earned grade-point averages. Tables and references are included. (AW)

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The focus of this study is the effectiveness of a developmental reading course for freshman students enrolled in a college of nursing. Reading rate, reading comprehension, reading efficiency, grade point average, and dropout are examined. This study reports findings for a special grouping of students.

The Effectiveness of a Developmental Reading Course in a College of Nursing

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Introduction

In this new decade, Americans are faced, as never before, with an abundance of the printed word which increases the demands of keeping abreast of changes in their chosen fields. Reading is basic to education, and education is the necessary support of our way of life.

In looking at the preparation of college students in 1941, Dearborn (1) concluded that even though entrance requirements were met by students, many were still severely enough handicapped in reading ability that they were unable to complete reading requirements in their courses. Further, he estimated that 10 to 20 per cent of college students have reading deficiencies.

Over the years, educators have continued to extol the need for effective college reading programs. Hoffman (2), among others, stated this need in 1954. She indicated that the increasing enrollment of students with divergent backgrounds and the added reading requirements of college students dictate the imperative need for reading programs in college. She concluded in her study that evidence indicated that reading programs do "achieve satisfactory, and in some cases remarkable, success." Further, she stated that a review of the literature indicated that approximately one-fifth of freshman students were reading on an eighth grade level.

Educators have stressed for decades that many students fail in college because of ineffective reading habits. In 1964, Francis Keppel (3), while serving as United States Commissioner of Education, commented:

> Perhaps the greatest educational need today is in the field of reading. Every examination of the problems of our schools, of poverty, every question raised by troubled parents about our schools, every learning disorder seems to show some association with reading difficulty.

Few would disagree with the belief that reading is developmental in nature and is imperative in the life of the student. However, most colleges and universities have not supported this belief with action.

The Problem

The purpose of this study was to determine the relative effectiveness of a developmental reading course for freshman students enrolled in the College of Nursing at the University of Kentucky. Specifically, the author attempted to determine:

1. The effect on reading rate, comprehension, efficiency and the relative permanency of the effects.
2. The effect on grade point average after two semesters of college work.
3. The effect on dropout after two semesters of college work.

The Methods and Procedures

The randomized control group pretest-posttest design was used with two experimental and two comparison groups (7). Students were assigned randomly to four groups of equal size and, by a flip of a coin, the groups were designated either comparison or experimental.

The Sample

The sample consisted of 84 College of Nursing freshman students enrolled at the University of Kentucky during the fall semester of the 1969-1970 academic year. All first semester freshman nursing students were included in the study.

The Instruments

The basic instructional instrument selected for the purpose of this study was Increasing Reading Efficiency by Lyle L. Miller, designed for the use of high school students in grades eleven and twelve, college students and adults (4). Increasing Reading Efficiency contained seven series of reading exercises designed to increase reading rate, comprehension and efficiency. In addition to this workbook, Lyle L. Miller's Maintaining Reading Efficiency was used to provide practice for students in longer reading exercises (5). This workbook provided supplementary exercises with accompanying test questions. The 30 exercises encompassed a wide range of readability levels ranging in difficulty from seventh grade to adult. The tests selected for this study were the Maintaining Reading Efficiency Tests, History, forms Japan, Brazil and Switzerland. The predicted grade point average used for students was determined by the American College Testing program for the University of Kentucky.

The Method

In the fall of 1969, the Brazil test was administered to all participating subjects. Forty-two students were selected randomly for both the experimental and comparison groups. For the purposes of data analysis the two experimental and two comparison groups, respectively were combined into one experimental and one comparison group.

All groups were composed of female students; each group had a mean age of 18 years. Students were subject to the required College of Nursing curriculum. All groups were aware of their participation in some type of experiment. Each group met in the same classroom in the College of Nursing, thereby experiencing the same general physical environment.

Only the experimental groups participated in the developmental reading program. They met once a week in the College of Nursing for two hours over a ten week period. Comparison groups met once a week for two hours over a ten week period; they were allowed access to the College of Nursing library and were encouraged to use the two hour period for study purposes. Classes began in September 1969 and ended in November 1969. During the first session, the Maintaining Reading Efficiency Test, History, form Brazil was administered as a pre-test to comparison and experimental groups.

At the completion of the ten week period, Maintaining Reading Efficiency Test, History, form Japan was given as a post-1 test to experimental and comparison groups. In April 1970, five months after the post-1 test, the Maintaining Reading Efficiency Test, History, form Switzerland was given to experimental and comparison groups as a post-2 test. At the end of the academic year, group cumulative grade point averages were compared. Due to campus unrest and the state of emergency declared by the president at the University of Kentucky, students were given the option of leaving campus at the end of the year without prejudice to academic standing. Students who chose to leave campus were given the option of receiving a grade based on work completed as of the date of the emergency, or of completing course requirements at a later date.

Definition of Terms

Predicted Grade Point Average

Predicted Grade Point Average (PGPA) was defined as the average determined by the American College Testing (ACT) program procedures using the composite score and the student's high school average (HSA).

Post-Treatment Grade Point Average

This was defined as the student's grade point average at the University of Kentucky after the first and second semesters in 1969-1970.

Dropout

A dropout was defined as a person who withdrew from the University of Kentucky during the first or second semester 1969-1970.

Reading Rate

This was defined as a numerical expression indicating the average number of words read in a unit of time. Reading rate is expressed in words per minute (WPM).

Reading Comprehension

This was defined as the per cent of correct answers for a given test on the materials read.

Reading Efficiency

This was defined as the amount of reading material that was comprehended in a given unit of time. Reading efficiency scores are computed by multiplying reading rate by comprehension rate. Reading efficiency is a numerical expression that indicates the rate of effective reading in words per minute (6).

Initial Change

This was defined as the change occurring between the pre-test (beginning of course) and post-1 test (end of course).

Subsequent Change

This was defined as the change occurring between the post-1 test and the post-2 test (five months later).

Ultimate Change

This was defined as the change occurring between the pre-test and the post-2 test.

Results

This section, by means of tables, presents the data and the statistical analysis of the data gathered during the study. In order to determine the relative effectiveness of a developmental reading course in the College of Nursing at the University of Kentucky a number of group comparisons were made. Only the .05 and .01 levels of significance will be referred to in this study.

Reading Skills

Pre-, Post-1, and Post-2 Tests. All groups were tested prior to the introduction of the experimental treatment, after the experimental treatment (ten weeks), and five months after the completion of the experimental treatment. The comparison and experimental group means for all three tests were submitted to a *t*-test for an analysis of the significance of the difference between means. The results are presented in Tables 1, 2, and 3.

Table 1

Summary of Comparisons of Means on Pre- Reading Efficiency

Test for Comparison and Experimental Groups

Variable	Comparison Means	Experimental Means	t Ratio	Level of Sig.
Rate	217.3	208.4	0.84	N.S.
Comprehension	74.9	73.9	0.40	N.S.
Efficiency	161.9	153.4	1.04	N.S.

t Ratio of 1.99 = .05 level; 2.64 = .01; d.f. = 82

Table 2

Summary of Comparisons of Means on Post-1 Reading Efficiency

Test for Comparison and Experimental Groups

Variable	Comparison Means	Experimental Means	t Ratio	Level of Sig.	Direction
Rate	209.9	1004.5	6.10	.01	E > C
Comprehension	81.8	66.1	6.09	.01	E < C
Efficiency	170.9	657.1	5.49	.01	E > C

t Ratio of 1.99 = .05 level; 2.64 = .01; d.f. = 80

Table 3

Summary of Comparisons of Means on Reading Efficiency Post-2

Test for Comparison and Experimental Groups

Variable	Comparison Means	Experimental Means	t Ratio	Level of Sig.	Direction
Rate	218.0	501.9	6.64	.01	E > C
Comprehension	67.9	59.7	2.90	.01	E < C
Efficiency	147.4	301.1	5.56	.01	E > C

t Ratio of 1.99 = .05; 2.64 = .01; d.f. = 74

The mean group scores in reading rate, comprehension and efficiency were not significantly different on the pre-test. Therefore, the experimental and comparison groups were fairly equivalent on abilities measured prior to the introduction of a reading group experience.

The comparison and experimental groups differed significantly on all three variables on the post-1 test. The experimental group's mean score for reading rate and reading efficiency was significantly higher than the comparison group; however, the mean comprehension score for the comparison group was significantly higher than the mean score for the experimental group.

Groups differed significantly on all three variables on the post-2 test. Mean scores in reading rate and efficiency significantly favored the experimental group. The comparison group continued to experience a higher reading comprehension mean score significantly greater than the experimental group's score.

Within Group Initial, Subsequent, and Ultimate Reading Gain. Within group performance on pre-post-1, post-1-post-2, and pre-post-2 tests was submitted to a *t*-test for analysis of the significance of the difference between means. Data for each group are presented in Tables 4, 5, and 6.

Both groups experienced significant initial changes in variables. The experimental group improved significantly their reading rate and efficiency mean scores while experiencing a significant drop in comprehension mean score. The comparison group experienced no significant change in reading rate or efficiency but scored significantly better on the comprehension variable.

Group comparisons on mean scores from post-1 and post-2 indicate that each group had a significant mean score drop on all variables with the one exception being reading rate for the comparison group.

Table 4

Summary of Comparisons of Means on Reading Efficiency Tests For Each Group on Pre-Test to Post-1 Test Measures

Variable	Group*	Pre Means	P-1 Means	t Ratio	Level of Sig.	Direction	St. Error of Diff.
Rate	E	209.2	1004.5	6.09	.01	P<P-1	131.52
	C	217.3	209.9	0.89	NS		8.42
Comprehension	E	73.6	66.1	3.24	.01	P>P-1	2.38
	C	74.9	81.8	2.71	.01	P<P-1	2.60
Efficiency	E	153.6	657.1	5.68	.01	P<P-1	89.61
	C	161.9	170.9	1.16	NS		7.84

t Ratio of 2.02 = .05 level; 2.70 = .01 level; d.f. = 40

*E = Experimental Group C = Comparison Group

Table 5

Summary of Comparisons of Means on Reading Efficiency Tests for Each Group on Post-1 Test to Post-2 Test Measures

Variable	Group*	P-1 Means	P-2 Means	t Ratio	Level of Sig.	Direction	St. Error of Diff.
Rate	E	1018.0	501.9	4.89	.01	P-1>P-2	167.48
	C	210.9	218.0	1.17	NS		9.78
Comprehension	E	65.8	59.7	2.76	.01	P-1>P-2	2.61
	C	81.3	67.9	6.04	.01	P-1>P-2	2.98
Efficiency	E	663.8	301.1	5.13	.01	P-1>P-2	97.76
	C	170.9	147.4	3.93	.01	P-1>P-2	8.96

t Ratio of 2.03 = .05 level; 2.72 = .01 level; d.f. = 37

*E = Experimental Group C = Comparison Group

Table 6

Summary of Comparisons of Means on Reading Efficiency Tests for Each Group on Pre-Test and Post-2 Test Measures

Variable	Group*	Pre Means	P-2 Means	t Ratio	Level of Sig.	Direction	St. Error of Diff.
Rate	E	209.9	501.9	7.59	.01	Pre < P-2	43.71
	C	218.3	218.0	0.04	NS		9.84
Comprehension	E	73.4	59.7	6.77	.01	Pre > P-2	2.49
	C	74.8	67.9	3.63	.01	Pre > P-2	2.89
Efficiency	E	153.6	301.1	6.51	.01	Pre < P-2	28.24
	C	162.5	147.4	2.30	.05	Pre > P-2	8.59

t Ratio of 2.03 = .05 level; 2.70 = .01 level; d.f. = 37

*E = Experimental Group C = Comparison Group

Ultimate mean scores were significantly different for the experimental group on all three variables and for the comparison group on reading comprehension and reading efficiency. The experimental group significantly improved mean scores in reading rate and reading efficiency while experiencing a significant drop in comprehension mean score. The comparison group scored significantly lower in reading comprehension and efficiency from pre- to post-2 test.

Grade Point Average

Group means for the predicted grade point average, earned grade point average, and within group predicted and earned grade point average were submitted to a t-test for analysis of the significance of differences between group means. The results are presented in Tables 7 and 8.

The comparison and experimental groups did not differ significantly in their predicted GPA or their earned GPA. The within-group comparisons of predicted GPA and earned GPA showed no significant differences. The experimental and comparison groups attained a .77 and .61 correlation, respectively, when their predicted GPA and earned GPA were compared.

Dropout

Fisher's exact test was used to determine group dropout differences. No significant differences was found in number of dropouts. The writer noted that the comparison group experienced a dropout rate three times greater than the experimental group. The data are presented in Table 9. The comparison and experimental group had 7.2 and 2.4 per cent dropout respectively.

Summary

No significant differences were found between groups on the pre-test variables; significant differences favoring the experimental group were found

Table 7

Summary of Comparison of Means for Experimental and Comparison Groups on Predicted and Earned Grade Point Average

Variable	Experimental		Comparison		t	Level
	Mean	S.D.	Mean	S.D.	Ratio	of Sig.
PGPA	2.21	.33	2.17	.27	.55	NS
GPA	2.18	.68	2.25	.74	.39	NS

t Ratio of 2.03 = .05 level; 2.70 = .01 level; d.f. = 37

Table 8

Summary of Within Group Comparison of Means on Predicted

And Earned Grade Point Average

Group	PGPA		GPA		t	Level of
	Mean	S.D.	Mean	S.D.	Ratio	Sig.
Experimental	2.22	.33	2.18	.68	.50	NS
Comparison	2.21	.24	2.25	.74	.32	NS

t Ratio of 2.03 = .05 level; 2.70 = .01 level; d.f. = 37

Table 9

Summary of Student Dropout for Comparison and Experimental Groups

Variable	Experimental	Comparison	Fisher's Exact Probability	Level of Sig.
Those students withdrawing during the first or second semester 1969-1970.	1	3	.616	NS
Those students remaining enrolled for two complete semesters 1969-1970.	41	39		

on all variables on the post-1 test and significant differences were found on all variables on the post-2 test. On the final test, the experimental group scored significantly higher on the reading rate and efficiency variable; the comparison group scored significantly higher on the reading comprehension variable.

Initial and ultimate gain scores for the experimental group were improved for reading rate and efficiency. This group attained a significant initial, subsequent and ultimate drop in reading comprehension and a significant subsequent drop in reading rate and efficiency.

The comparison group showed no change in initial, subsequent or ultimate reading rate. However, this group experienced a significant initial increase in reading comprehension with a significant subsequent drop in reading comprehension and efficiency. A significant ultimate drop in reading efficiency and comprehension was found also for the comparison group.

No significant differences were found between groups in predicted GPA and earned GPA. Within-group comparisons of the predicted and earned GPA revealed no significant differences.

Conclusions

On the basis of the data presented in this study, the following conclusions appeared warranted:

1. A developmental reading course was helpful to freshman students in improving significantly their reading rate and efficiency.
2. Reading rate and efficiency can be improved significantly with a significant drop in comprehension. This drop in comprehension may be a result of the sample (female nursing students).
3. Students during their freshman year may experience a drop in reading comprehension score.

4. Considering the reading content of the instruments used, students in both the comparison and experimental groups demonstrated adequate comprehension scores for their reading purposes even though both groups dropped significantly in comprehension after seven months.
5. The experimental group's mean reading efficiency score indicates a significant improvement in reading flexibility and effectiveness. This group's mean score expresses a significant improvement in actual material grasped per unit of study time. For example, after five months, the experimental and comparison groups attained a reading efficiency score of 301 and 147 words per minute, respectively.
6. A significant amount of reading rate and efficiency gained during a developmental reading experience was retained by freshman students after a five months period.
7. Students experiencing a developmental reading program dropped approximately 50 per cent in reading rate and efficiency after a five month period; however, their ultimate gains in reading rate and efficiency were significant.
8. The difference in dropout in this study was not sufficient to be statistically significant.
9. Because of the unrest on the University of Kentucky campus during the final examination period for the second semester, GPA was not based on traditional patterns of evaluation. Therefore, a valid group GPA comparison was not possible.
10. Under the conditions existing on the campus during the final examination period for the second semester, this reading experience had no measurable effect on GPA.

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